Reanalyzing Australian Tropical Cyclones

The JIP aims to improve the historical record describing tropical cyclone location, intensity and structure from the early 1980's to the present.

Participants:

Chevron, NERA National Energy Resources Australia, Shell, woodside

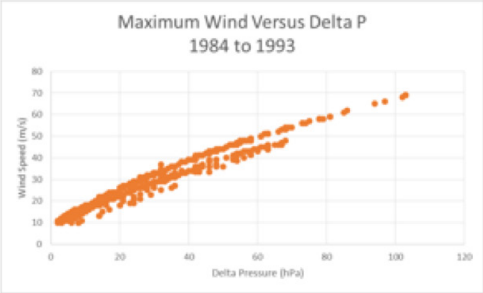
Principle service provider: Australian Bureau of Meteorology (BoM)

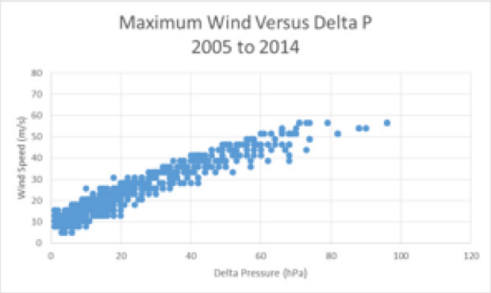
What is the problem:

The process for recording of tropical cyclone characteristics in Australia has changed substantially over the past 35 years. This is due to the advent of advanced satellite based monitoring capabilities, the development of standardized measurement strategies over the past 10 years, and because of significant advances in the understanding of the science of tropical cyclone internal processes.

The graphic below shows the variation of wind and central pressure relationships prior to 1993 (left panel), and after 2005 (right panel), indicating that different methods have been used to estimate intensity through time.

Operators are therefore often challenged when developing design criteria based on the historical record due to the uncertainties in data quality. This can lead to overly conservative design decisions being taken.





International Association of Oil & Gas Producers

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What is the solution:

Well developed methods exist to estimate intensity and structure from real time satellite images, and over the past 10 years operational techniques have been developed to automate the estimation process in a manner that produces systematic, reproducible results. Additionally, a large repository of historical satellite imagery exists for the Australian region since the early 1980's. Through this JIP, present-day operational techniques will be used to look back at the historical satellite images to produce a homogeneous record that can be compared with the database of tropical cyclone observations.

Progress to date:

The JIP has been completed and a revised historical archive produced using objective methods of reanalysis. However, the BoM 'best track' database from 2004 onwards is considered the most reliable source of tropical cyclone structure parameters (radius to gales, severe gales and hurricane force winds by quadrant for example).

Next steps:

The database has been delivered to the JIP participants, but will also be made available to the public through the Bureau website.

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